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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,489	10/23/2002	Roy Edward Rand	124365	7330
23446	7590	03/29/2004	EXAMINER	
MCANDREWS HELD & MALLOY, LTD 500 WEST MADISON STREET SUITE 3400 CHICAGO, IL 60661			JOHNSTON, PHILLIP A	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/065,489	RAND, ROY EDWARD	
	Examiner	Art Unit	
	Phillip A Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3-19-2004</u> . | 6) <input type="checkbox"/> Other: ____ |

Detailed Action

Claims Rejection – 35 U.S.C. 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,386,445 to Rand, in view of Findeisen, U.S. Patent No. 3,586,901, and in further view of Matsui, U.S. Patent No. 5,442,183.

Rand (445) discloses an apparatus and method to control beam-generated ions in a CT scanner that includes;

(a) Removing ions with an upstream clearing electrode, as recited in Claims 1 and 6. See Column 1, line 63-68; and Column 2, line 1-19.

(b) Trapping ions with a trap electrode, as recited in Claims 1,3,5,7, 10 and 12. See Column 2, line 20-29 and 57-68.

(c) A CT system, as recited in Claims 7, and 14-16. See Column 3, line 44-62.

Rand (445) as applied above fails to teach a tube located downstream of an ion trap, as recited in Claims 7 and 8.

However, Findeisen (901) discloses an electron gun having a conductive shroud (tube) 16 attached to second anode 14 that extends downstream from the electron gun chamber. The first anode, represented by button 30 of FIG. 1, is at a higher potential than the second anode, represented by isolation means 14. As illustrated graphically, in FIG. 3, this creates a "potential hill" 40 which each positive ion formed outside the region between cathode 23 and anode 14 must overcome in order to be attracted to the cathode. The height of this potential hill may conveniently be from 50 to 150 volts. Accordingly, most of the positive ions having the requisite kinetic energy requirements at the instant of formation to reach the cathode of a conventional electron gun are actually prevented from reaching the electron gun cathode because their kinetic energies are insufficient to overcome the potential hill existing between the first and second anodes of the electron gun; only the relatively few ions with kinetic energy above 50 to 150 electron volts along path 37 at the instant of emergence from the electric field of anode 14 can enter the electron gun chamber and strike the cathode thereof. See Column 4, line 47-61; and Column 5, lines 5-24, and 40-55.

It is implied herein that the use of a tube that extends downstream from anode 14 in accordance with Findeisen (901) is equivalent to the use of a tube located downstream from an ion trap, as recited in Claims 7 and 8.

Therefore it would have been obvious to one of ordinary skill in the art that the CT scanning system of Rand (445) can be modified to use a conductive tube downstream from an ion trap in accordance with Findeisen (901), to provide a constant electric field, thereby reducing perturbations of the electron beam path.

Rand (445) in view of Findeisen (901) as applied above fails to teach the use of a grounded tube, as recited in Claims 1, 7, and 8. However, Matsui (183) discloses a charged particle beam apparatus that includes a grounded final cylindrical electrode. See Column 15, line 61-65.

Therefore it would have been obvious to one of ordinary skill in the art that the CT scanning system of Rand (445) in view of Findeisen (901) can be modified to use a grounded cylindrical electrode in accordance with Matsui (183), to provide an electric field that minimizes aberration.

Regarding Claims 2, 4, 9, 11, 13, and 17-21, Rand (445), in view of Findeisen (901), in further view of Matsui (183), discloses the claimed invention except for;

- (a) Adjusting the aperture of the trap electrode to adjust spherical aberration correction, as recited in Claims 2, 11, 17, and 20.
- (b) Adjusting the radius and position of the grounded tube to adjust the range of spherical aberration correction, as recited in Claims 4, 9, 13, 17-19, and 21.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the trap aperture size and the grounded tube radius, since it has been held that discovering an optimum value of a result effective variable involves only, routine skill in the art.

Matsui (183) discloses in FIG. 5(B) the result of computations on a chromatic aberration coefficient C_c and a spherical aberration coefficient C_s in effect when the electron beam 2 is focused using the electrostatic lens comprising the electrodes 5, 6 and 7 of FIG. 5(A). In this example, the working distance A is set for 3 mm, and the

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electrode-to-electrode distances B and C are set for 2 mm each. The final electrode 7 is connected to ground potential.

Matsui (183) is evidence that ordinary workers in the art of spherical aberration correction would find the reason, suggestion, or motivation to vary the aperture size of electrodes, as well as the radius of the cylinder to determine there effects in reducing spherical aberration.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform calculations utilizing electrode dimensions as variables to improve spherical aberration.

In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). A particular parameter must first be recognized as a result-effective variable, i.e., a variable, which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.


Conclusion

3. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

March 19, 2004


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2881